BEFORE THE

Federal Communications Commission

WASHINGTON, D.C.

In the matter of	)	
	)	
Redesignation of the 17.7-19.7 GHz	)	
Frequency Band, Blanket Licensing of	)	IB Docket No. 98-172
Satellite Earth Stations in the	)	RM-9005
17.7-20.2 GHz and 27.5-30.0 GHz	)	RM-9118
Frequency Bands, and the Allocation of	)	
Additional Spectrum in the 17.3-17.8 GHz	)	
and 24.75-25.25 GHz Frequency Bands for	)	
Broadcast Satellite-Service Use	)	

To: The Commission

COMMENTS OF LORAL SPACE & COMMUNICATIONS LTD.

Loral Space & Communications Ltd. ("Loral") offers its comments in response to the Notice of Proposed Rulemaking in the above-captioned proceeding.[1] Loral and its business units hold FCC licenses to launch and operate Ka-band GSO/FSS satellite systems,[2] and, as the Commission noted, Loral was one of the

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1 In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.85-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use, FCC 98-235, IB Docket No. 98-172 (rel. Sept. 18, 1998)("NPRM"). See also Order, DA 98-2231 (rel. Nov. 2, 1998)(extending the pleading cycle deadlines).

2 See In re Assignment of Orbital Locations to Space Stations in the Ka-Band, *Order*, 12 FCC Rcd. 22004 (1997); In re Assignment of Orbital Locations to Space Stations in the Ka-Band, *Order*, 13 FCC Rcd. 1030 (1997); In re Application of Loral Space & Communications Ltd., *Order and Authorization*, 13 RCC Rcd. 1379; In re Application of Orion Atlantic, L.P., *Order and Authorization*, 13 FCC Rcd. 1416 (1997); In re Application of Orion Network Systems, Inc., *Order and Authorization*, 12 FCC Rcd. 23027 (1997).

original petitioners proposing a blanket licensing regime for GSO/FSS earth stations operating in certain portions of the Ka-band.[3] As the Commission recognizes, the thirteen GSO/FSS Ka-band licensees "have the potential to provide global Internet access, two-way digital communications, videoconferencing, interactive multimedia, telemedicine and residential voice and data communications services" to millions of businesses and consumers.[4]

I. LORAL SUPPORTS REDESIGNATION OF THE 17.7-19.7 GHz BAND

Loral applauds the Commission's efforts to develop a blanket licensing regime for GSO/FSS Ka-band satellite systems that will permit millions of Ka-band earth terminals to be installed in the United States without requiring individual earth station licensing or burdensome frequency coordination. A blanket licensing regime and access to sufficient spectrum is required for the commercial introduction of wideband satellite services in the Ka-band spectrum. However, Loral and other satellite operators cannot deploy advanced systems until sufficient useable spectrum is available to provide service to customers using mass-produced, small transmit/receive earth terminals. This rulemaking should ultimately result in access to more usable spectrum for both satellite and terrestrial users than currently

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3 NPRM at ¶ 11.

4 NPRM at ¶ 9. Other GSO/FSS Ka-band licensees include Comm, Inc., GE American Communications, Echostar, Hughes Communications Galaxy, KaStar Satellite Communications, Lockheed Martin, Morning Star Satellite, NetSat 28, PanAmSat and VisionStar. Id. at n.26.

exists under the present allocation that essentially allocates the 18 GHz band on a co-primary basis to terrestrial and satellite services.

While Loral would have preferred that additional spectrum be made available for primary GSO/FSS satellite use, Loral supports the designation of spectrum between terrestrial and satellite services in the Commission's proposed band plan, with two caveats, discussed below. The Commission has correctly recognized that in order for satellite and terrestrial services to prosper in the 18 GHz band, band segmentation is required. To ensure that the millions of Ka-band satellite earth stations can be deployed under a blanket licensing regime, a total of 500 MHz of spectrum in the 17.8 - 19.7 GHz band is needed for GSO/FSS systems. Loral believes that at least 250 MHz of contiguous unshared and unencumbered spectrum in the 17.8-19.7 GHz band (specifically 18.3-18.55 GHz) is required for GSO/FSS satellite operators to launch and operate commercially viable systems. A minimum additional 250 MHz of FS/FSS co-primary spectrum in the 17.8-19.7 GHz band is required for GSO/FSS systems. It is expected that this shared spectrum will be used for gateway terminals and other applications that will be individually licensed and coordinated.

Loral strongly objects to any further sharing of spectrum between GSO/FSS and terrestrial services, including the suggestion that the Commission may designate an additional 100 MHz of spectrum in the 18.3-18.4 GHz band to be shared on a co-

primary basis between terrestrial fixed services and GSO/FSS.[5] This proposal fundamentally conflicts with the Commission's observations that FS/FSS sharing is not feasible in these bands. Loral believes that the entire 18.3-18.55 GHz band should be designated for GSO/FSS on a primary basis.[6] Allocating the 18.3-18.4 GHz band on a shared, co-primary basis would preclude any possibility that widely-deployed Ka-band earth terminals could operate in the 18.3-18.55 GHz band.

II. SHARING BETWEEN UBIQUITOUS KA-BAND TERMINALS AND FIXED SERVICES IS INFEASIBLE

Similarly, the Commission's proposal to permanently grandfather existing terrestrial users on a co-primary basis in bands that are to be allocated on a primary basis for satellite services[7] will preclude satellite services from using those bands to serve the millions of mass-market earth terminals that will communicate with Ka-band satellite systems. Loral opposes this proposal and suggests that the Commission adopt a sunset plan to ensure that terrestrial users transition out of primary FSS bands.

The Commission acknowledges that it would be "impractical for terrestrial fixed service providers to coordinate new operations to avoid interference" where blanket licensing is

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5 NPRM at ¶ 35.

6 Loral notes that the current downklink PFD limit that applies in the 18.6-18.8 GHz band to protect spaceborne scientific systems precludes viable commercial GSO/FSS service in that band.

7 NPRM at ¶ 40.

permitted.[8] Even without blanket licensing, the Commission notes, the mere presence of ubiquitously deployed small satellite earth stations "could have a serious adverse effect on the ability of the terrestrial fixed service to start a new operation or expand existing operations in a shared band."[9]

Licensees in the fixed service are even more insistent that co-frequency sharing between users in the fixed service and the fixed satellite service is not feasible. In a recent petition, advocates for cable television relay service ("CARS") licensees ("CARS Petitioners") noted that terrestrial use of the 18 GHz band "can cause interference to satellite operators within a 45-mile oblong area from each private cable transmitter site."[10] According to the CARS Petitioners, "where private cable has been launched, its 18 GHz paths usually criss-cross an urban market and, therefore, saturate the market, making it unworkable for private cable operators to protect satellite operators."[11] Indeed, the CARS Petitioners admit that there "is no viable method for private cable operators to share the band with blanket-licensed earth stations that are highly interference-sensitive."[12]

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8 NPRM at ¶ 19.

9 Id.

10 See "Emergency Request for Immediate Relief" of The Independent Cable & Telecommunications Association, IB Docket No. 98-172 (filed Nov. 5, 1998) at p. 5. ("CARS Petition").

11 Id. at p. 6.

12 Id. at (i).

Loral agrees with the CARS Petitioners that licensing CARS services on a primary basis would foreclose deployment of Ka-band services wherever CARS applicants were licensed.[13] The level of interference from existing installations will be no less than the level of interference from new or expanded operations. In light of the fact that both satellite operators and terrestrial operators acknowledge that they cannot share this spectrum, the Commission must relocate existing terrestrial licensees as well as limit additional primary terrestrial licenses in bands that are designated for primary GSO/FSS use.[14]

If the Commission imposes its grandfathering proposal, and permits existing terrestrial services to share the 18 GHz band, satellite operators will not be able to ensure that sufficient spectrum is available in any given area. After arranging for service, customers may discover that service may not be available in a particular location because grandfathered terrestrial use precludes reception of satellite signals. Grandfathering on a co-primary basis simply does not make sense in bands where millions of earth terminals are to be deployed. A sunset of

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13 For all the reasons discussed above, Loral opposes the CARS Petition and the Petition for Interim Relief of the Fixed Point-to-Point Communications Section, Wireless Communications Division of the Telecommunications Industry Association, IB Docket No. 98-172 (filed Nov. 2, 1998).

14 NPRM at ¶ 41. Satellite operators will be unable to design their systems to avoid interference from existing terrestrial fixed service operations. Therefore, as the Commission suggests, relocation of some or all terrestrial facilities may be desirable. Id.

existing terrestrial use in the 18.3-18.55 GHz band will ensure that satellite operators can provide service to millions of customers. Fortunately, there is ample time -- several years -- for existing terrestrial users to exit the 250 MHz spectrum required for GSO/FSS operation before GSO/FSS systems come into use.

It is not clear precisely how many CARS systems are licensed in the 18.4 - 18.55 GHz band. The CARS Petition identifies a number of systems which are in the planning stage and one which has been constructed. It is difficult to determine what conditions should apply to relocations without complete and accurate information as to the number and location of CARS facilities licensed on a primary basis.

III. COMMENTS ON OTHER ISSUES

A. Secondary Allocations to the Fixed Service

Loral does not believe that the Commission's proposal to allow secondary operations on a non-interference basis by both terrestrial fixed service and FSS is feasible.[15] However, if the FCC implements this proposal, Loral agrees that any applicant wishing to use the bands on a secondary basis should be required to demonstrate, as a technical matter, that such use will not cause interference to users operating on a primary basis, and that the secondary service can accept interference from primary service operations.[16] Loral recommends that a specific technical

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15 NPRM at ¶ 33.

16 NPRM at ¶ 33.

demonstration of non-interference should be presented to the Commission and all affected licensees operating on a primary basis, and placed on public notice for comment. Only after this process is complete should the Commission, based on the record established, consider authorizing operation on a secondary basis.

B. Annual Reporting Requirements

The Commission has proposed that, consistent with its policies for Very Small Aperture Terminals ("VSATs"), Ka-band system licensees report annually the number of earth stations actually brought into service.[17] Loral does not object to this proposal. However, Loral does not support the Commission's proposal to require satellite operators to provide the location of each ubiquitously-deployed satellite earth terminal.[18] Requiring satellite operators to monitor the specific location and frequency usage of millions of earth terminals would be expensive and difficult. Unlike traditional VSATs, Ka-band satellite services are expected to be mass-marketed, thus maintaining an accurate and up-to-date location database would be nearly impossible. To the extent that an accurate list could be compiled and disclosed, this requirement would force satellite companies to reveal competitively sensitive information.

Of course, where terrestrial and satellite services share co-primary spectrum, individual earth stations should be licensed and coordinated under the Commission's rules. As a consequence,

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17 NPRM at ¶ 46.

18 NPRM at ¶ 45.

location and frequency use information will be maintained in the Commission's public licensing database files for the relatively limited number of "gateway" earth terminals planned for operation in spectrum that includes frequencies shared on a co-primary basis between terrestrial and satellite services.[19]

C. Technical Requirements for Intra-Service Sharing

The Commission has raised several questions concerning the appropriate earth station antenna performance envelope, EIRP power flux-densities, and other technical criteria.[20] Loral has worked actively with the GSO Ka-band Licensees Blanket Licensing Working Group ("BL-WG") to address some of the technical criteria to permit blanket licensing of relatively low-cost earth terminals to millions of customers in the United States. The BL-WG has made significant progress toward developing criteria that will permit blanket licensing of earth stations without causing interference to other Ka-band satellite systems. Loral has signed the report of the BL-WG that is being filed concurrently in this proceeding and urges the Commission to consider carefully the work of the group. Based on that work and its own research, Loral responds to specific technical proposals made in the NPRM.

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19 The number of these "gateway" terminals depends on the satellite operator's specific system design and business plans. Potentially, thousands of "gateway" terminals may be installed in a particular system.

20 NPRM at ¶¶ 50-60.

1. Uplink Off-Axis EIRP Density

Loral suggests that the antenna performance requirements provided by Section 25.209 of the Commission's rules be extended to be applicable within 3 degrees of the plane formed by the geostationary orbit.[21] As the Commission suggests, Loral supports specification of an earth-station gain value over the entire geostationary arc, coupled with a maximum power density specification.[22]

However, Loral does not agree with the values suggested by the Commission. Loral suggests that all of the results proposed by the Commission be reduced by 2.5 dBW. Loral also suggests defining the uplink off-axis EIRP densities starting at 2°, rather than 1° as the Commission proposes.[23] These suggestions result in the off-axis EIRP densities no greater than the composite curve described below:

$32.5 - 25 \log(\theta)$ dBW/MHz	$2° <= \theta <= 7°$
11.4 dBW/MHz	$7° <= \theta <= 9.2°$
$35.5 - 25 \log(\theta)$ dBW/MHz	$9.2° <= \theta <= 48°$
-6.5 dBW/MHz	$48° <= \theta <= 180°$

Loral does not agree with the Commission's proposal that the uplink power density envelope described above be imposed only in the plane of the geostationary orbit but suggests that the above values be applicable within 3 degrees of the plane formed by the geostationary orbit. Loral suggests a clear weather EIRP density

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21 NPRM at ¶ 50.

22 NPRM at ¶ 51.

23 NPRM at ¶ 52.

envelope curve which is relaxed by 3 dB from the values set out on page 10. Loral also supports additional work by the BL-WG to reach agreement on this issue.

2. Uplink Adaptive Power Control

Loral supports the Commission's proposal to require all operators seeking blanket licensing authorization to submit a technical description of how the Commission's requirement[24] will be met.[25] However, because this information will necessarily reveal proprietary technologies, Loral requests that the Commission modify its proposal to require that the technical showing be made on a confidential basis to the Commission.

Loral agrees with the Commission that requirements for uplink power control similar to the current Ku-band parameters should be developed.[26] Loral believes these values are best developed by the satellite industry, and that the BL-WG is the appropriate forum in which satisfactory values can be defined.

3. Power Flux Density

The Commission noted that important service and international coordination issues are raised by imposing power flux-density limits.[27] In order for blanket licensing to work, satellite operators must coordinate power levels of adjacent satellites. For this reason, Loral supports the recommendations

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24 47 C.F.R. § 25.204 (1998).

25 NPRM at ¶ 57.

26 NPRM at ¶ 58.

27 NPRM at ¶ 59.

being made by the BL-WG. Specifically, Loral supports PFD limits defined in two referenced bandwidths, with a 2 dB variation between the two values. As stated in the BL-WG report, the higher value (-118 dBW/m^2/MHz) would apply on a per-MHz basis, giving protection to any narrow-band carriers used. The lower value (-120 dBW/m^2/MHz) would apply when averaged across a 40 MHz bandwidth, generally the minimum bandwidth of wide-band carriers. However, higher PFD values should be permitted with the stipulation that coordination be performed with all affected operators.

4. Non-Compliant Earth Stations

The Commission proposes to allow operation of non-conforming Ka-band earth stations provided the applicant makes certain technical showings.[28] The potential to use non-conforming earth stations would afford satellite operators considerable flexibility. Loral supports licensing non-conforming earth stations, but urges the Commission to use an interference analysis approach as opposed to establishing maximum permissible uplink and downlink power limits. Loral recommends that the Commission's venerable ASIA computer program be replaced with a more up-to-date, user-friendly, spreadsheet-based interference analysis tool.

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[28] NPRM at ¶ 60.

5. Antenna Pointing Requirements

Loral agrees with the Commission that earth stations used to communicate with Ka-band systems are likely to be deployed in large numbers to mass-market audiences.[29] The Commission has proposed various methods (such as continuous reception of a suitable pilot tone) to ensure that antenna pointing errors do not create the potential for interference to adjacent satellites. Although the proposed methods would adequately address the Commission's interference concerns, Loral believes that the Commission should permit Ka-band licensees to implement whatever antenna pointing measures are best suited for their individual systems, on the condition that required uplink off-axis EIRP limits are met. Loral does not object to a requirement that such a condition be made a part of the blanket licensing application process so long as all proprietary information made a part of such application is treated confidentially.

D. U.S. Border-Area International Coordination Issues

Loral agrees that because Canada and Mexico have allocated the 18.3-18.55 GHz, 18.8-19.3 GHz, 28.35-28.6, 28.6-29.1, and 29.25-5 GHz bands for co-primary use by both terrestrial fixed services and FSS, some cross-border coordination will be necessary.[30] Loral recommends that the Commission negotiate bilateral agreements with the Canadian and Mexican administrations to address coordination between FS and FSS users

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29 NPRM at ¶ 61.

30 NPRM at ¶ 71.

in the border areas. Loral supports defining an appropriate border zone within which special international coordination criteria would apply to FSS earth stations. Loral recommends that the specific technical parameters should be determined by a joint terrestrial-satellite industry group and presented to the Commission.[31]

IV. Conclusion

The Commission has correctly recognized that in order for satellite and terrestrial services to prosper in the 18 GHz band, band segmentation is required to ensure that the millions of Ka-band satellite earth stations can be deployed under a blanket licensing regime. A total of 500 MHz of spectrum in the 17.8 - 19.7 GHz band is needed for GSO/FSS systems: 250 MHz of contiguous, unshared and unencumbered primary spectrum in the 18.3-18.55 GHz band for widely-deployed earth stations and 250 MHz of spectrum elsewhere shared on a co-primary basis for gateway terminals that would be individually licensed and coordinated with terrestrial users under the Commission's rules. However, the Commission's proposal to permanently grandfather existing terrestrial users in bands that are designated for satellite use will not permit deployment of Ka-band services in areas where fixed services are licensed. A sunset of existing terrestrial use in the 18.3-18.55 GHz band will ensure that satellite operators can provide service to millions of customers.

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[31] Because Ka-band satellite services will not be deployed immediately, sufficient time is available for industry to recommend values to the Commission.

For the foregoing reasons, Loral requests that the Commission adopt rules consistent with these Comments.

Respectfully submitted,
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